EXHIBIT F

COVID-19 State of Vaccine Confidence Insights Report

Report 23 | **February 24, 2022** | Date Range: January 11 – 31, 2022



Summary

Findings. The first major theme of this report is that consumers and news outlets discussed the superiority of infection-induced immunity over COVID-19 vaccine-induced immunity with many concluding that infection-induced immunity is superior to vaccine-induced immunity. The second major theme is that consumers questioned the effectiveness of COVID-19 vaccines as a surge in breakthrough cases is being reported. A third theme is that consumers continued to have concerns about adverse events and unknown side effects of COVID-19 vaccines. The fourth and fifth findings during this report period are regarding consumers' concerns and opposition to pediatric COVID-19 vaccines and vaccine requirements.

Ways to take action. Federal, state, and local partners should continue to work together to explain the rationale for updated guidance, respond to gaps in information, and confront misinformation with evidence-based messaging. These efforts aim to increase confidence in COVID-19 vaccines and expand vaccine uptake more broadly. Partners should create and disseminate messages about the safety and effectiveness of the COVID-19 primary series and booster doses compared to acquiring SARS-CoV-2 infection-induced immunity.

SPECIAL UPDATE: The following link contains social media resources such as graphics, language, and social media calendars that our partners can use to address the issues raised in this report:

https://centersfordiseasecontrol.sharefile.com/d-sb8e03759bfe742649b787e1b3997f76c



Contents

- 2 Aims and Methods
- 3 **Major Themes**
- 3 Consumers and news outlets discussed the perceived superiority of infection-induced immunity versus vaccine-induced immunity.
- Consumers guestion the effectiveness of COVID-19 vaccines as news outlets report a surge in Omicronrelated breakthrough cases.
- **6** Continuing/Evolving Theme
- Consumers continue to have concerns about adverse events and unknown side-effects of COVID-19 vaccines
- Consumers express their concerns and opposition to pediatric vaccines
- Consumers voiced their opposition to any vaccine requirements
- **Appendix: Inputs and Sources**

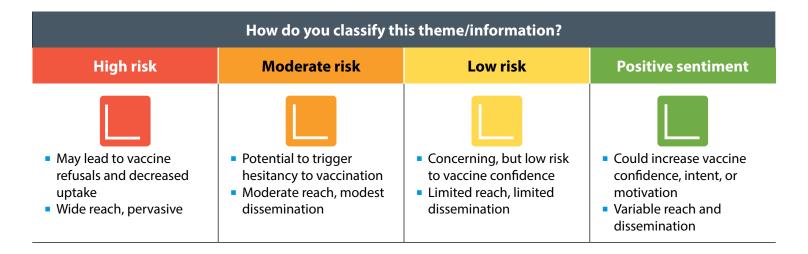
Centers for Disease Control & Prevention, COVID-19 Response, Vaccine Task Force Vaccine Confidence & Demand Team, Insights Unit

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC).

Aims and Methods

By rapidly reviewing and analyzing numerous sources and inputs (see <u>Appendix</u>), the COVID-19 State of Vaccine Confidence Insights Report emphasizes major themes influencing COVID-19 vaccine hesitancy and uptake. These are characterized by the level and type of threat to vaccine confidence, degree of spread, and directionality. In addition, by examining how consumers think and feel, social processes, and the practical issues around vaccination, the Insights Report seeks to identify emerging issues of misinformation, disinformation, and places where intervention efforts can improve vaccine confidence across the United States.

The information in this report is only a snapshot, and certain populations may be underrepresented. Images and quotes are illustrative examples and are not meant to comprehensively cover all content related to the highlighted themes.



How has this theme/idea changed over time (since last report or over the course of multiple reports)?

IncreasingInformation spreading rapidly

 \rightarrow

Stable Information remaining constant at prior level

DecreasingInformation is not gaining further traction and there has been no indication of additional activity

Major Themes^a



Consumers and news outlets discuss the perceived superiority of SARS-CoV-2 infection-induced immunity versus COVID-19 vaccine-induced immunity

A recent MMWR¹ and other studies,^{2,3,4} appeared to elevate the debate surrounding the importance of vaccine-induced immunity compared to infection-induced immunity. More than 175 news outlets wrote about the MMWR findings¹, specifically that by early October of 2021, people who had survived a previous infection had lower case rates than those who were vaccinated alone.^b Online searches for "CDC natural immunity" increased by 400% during this reporting period.^c Some social media users^{5,6,7,8,9,10} and a widely shared Wall Street Journal opinion piece¹¹ stated that the MMWR¹ was CDC's admission that infection-induced immunity is superior to vaccine-induced immunity.^d

Online discussions increased further when the National Collegiate Athletic Association (NCAA) allowed individuals who had documented COVID-19 within the past 90 days to meet their requirement of being fully vaccinated.¹² Social media users expressed their opposition^{13,14,15} and support of this policy.^{16,17,18}

If CDC admits naturally obtained antibodies are 5x stronger than the vax, why are not recognized as protected? They finally admitted what we've all been saying for two years.

\Diamond

Perceptions, Concerns, and Threats to Vaccine Confidence

- Social media users stated that the results of the recent MMWR is evidence that the CDC and government cannot be trusted. e.f.19.20
- There are increasing reports of people intentionally trying to get infected with SARS-CoV-2 by having social gatherings with people previously diagnosed with the disease. 21,22,23
- A notable conversation missing from the social media landscape is that the COVID-19 vaccines are a safer option to acquiring
 protection as opposed to infection-induced immunity.
- The belief that infection-induced immunity is superior to vaccine-induced immunity has the potential to impact vaccine confidence because people may believe that getting COVID-19 is a safer strategy to acquiring immunity than getting the vaccines.
- This theme could also have a negative impact on people's trust in the government and CDC as some perceive that this new evidence proves the government and CDC were lying about the superiority of vaccine-induced immunity.

Content Gaps and Information Voids

- Is SARS-CoV-2 infection-induced immunity superior to vaccine-induced immunity?
 - Getting sick with COVID-19 offers some protection from future illness with COVID-19, sometimes called "natural immunity."
 The level of protection people get from having COVID-19 may vary depending on how mild or severe their illness was, the time since their infection, and their age. No currently available test can reliably determine if you are protected after SARS-CoV-2 infection or for how long protection would last.²⁴
- Why should people get vaccinated if they were previously infected with COVID-19?
 - All COVID-19 vaccines currently available in the United States are effective at protecting against SARS-CoV-2 infection.
 Getting a COVID-19 vaccine gives most people some protection against COVID-19, even in people who have already been sick with the disease. Getting sick with COVID-19 can offer some protection from future illness, but the level of protection people get from having COVID-19 may vary depending on how mild or severe their illness was, the time since their infection, and their age.²⁵
- Will CDC incorporate the role of infection-induced immunity into their vaccination and mitigation guidance?
 - Currently, data are insufficient to determine the level of antibodies needed to indicate when an individual is protected from
 infection with the virus that causes COVID-19. There is neither an FDA-authorized/-approved test nor any other scientifically
 validated strategy that providers or the public can use to reliably determine whether a person is protected from infection.

^aCitations in this report are illustrative examples and are not the total number of instances of the corresponding themes.

^bAltmetric

^cGoogle Trends

dProject VCTR

^eCDC-INFO

^fRumble

COVID-19 State of Vaccine Confidence Insights Report Report 23 February 24, 2022

Misinformation Themes

- People with a previous COVID-19 infection are the safest people to be around.
- CDC has changed their stance on infection-induced immunity.^{9,28,29}

Ways to Take Action

- Create and disseminate messages, especially through trusted messengers, about the safety and effectiveness of the COVID-19 primary series and booster doses compared to acquiring SARS-CoV-2 infection-induced immunity.
- Create talking points and fact sheets for healthcare providers to aid in patient discussions regarding benefits of COVID-19
 vaccination versus infection-induced immunity.
- Disseminate messages that explain the limitations of using antibody titer results to determine protection from future infection with the virus that causes COVID-19.

gCDC-INFO



Consumers question the effectiveness of COVID-19 vaccines as news outlets report a surge in Omicron-related breakthrough cases

As the Omicron variant surged in January, public health experts warned that local hospitals would be overwhelmed, leading many consumers to question the effectiveness of COVID-19 vaccines. During this reporting period, media coverage highlighted the spike in breakthrough cases. Some social media users decried the vaccine as a failure and urged public health officials to acknowledge this. Recently published studies showed that while the primary COVID-19 vaccine series had lower effectiveness against the Omicron variant, COVID-19 vaccines and boosters still protect against severe illness, hospitalization, and death. Increased doubt in vaccine effectiveness and decreased trust in public institutions can affect vaccine confidence and uptake.

Perceptions, Concerns, and Threat to Vaccine Confidence

- Some social media users believed that the number of breakthrough cases from COVID-19 proves vaccines are ineffective.
- Consumers questioned why a vaccine is needed when vaccinated individuals can still get COVID-19 and spread it to others.^{38,39,40,41,42}
- Consumers expressed concern about the continued need for booster shots to protect against COVID-19. 43,44,45



Content Gaps and Information Voids

- Do you still need a booster dose if you tested positive for COVID-19?
 - COVID-19 vaccination causes a more predictable immune response than infection with the virus that causes COVID-19.
 Getting a COVID-19 vaccine gives most people a high level of protection against COVID-19 and can provide added protection for people who already had COVID-19.46
- Why should you get a COVID-19 vaccine if you can still get a SARS-CoV-2 infection and spread it to others?
 - Fully vaccinated people with a vaccine breakthrough infection are less likely to develop serious illness than those who are unvaccinated and get COVID-19. Even when fully vaccinated people develop symptoms, they tend to be less severe than in unvaccinated people.⁴⁷

Misinformation Themes

- COVID-19 vaccines are causing a surge in the number of COVID-19 infections and deaths. 48,49,50
- COVID-19 vaccines are ineffective, and should not be called vaccines.^{51,52,53}
- Government officials are aware that vaccines are ineffective but are intentionally withholding information.^{54,55}

Replying to @CDCgov Why are you still pushing a experimental drug when 1-it is not effective, 2-there is a 99.997% survival rate amongst unvaccinated, 3-there are medications to treat the illness if contracted, 4-there are serious adverse effects in taking this experimental drug. 5-provide true data 12:06 PM · Jan 19, 2022 · Twitter for iPhone

Ways to Take Action

- Continue to disseminate and amplify messages that demonstrate why vaccines are still an important tool to protect against severe COVID-19 infection, hospitalization, or death.
- Create and disseminate messages that educate the public about breakthrough cases and how they are expected due to the high transmissibility of the Omicron variant.

Continuing and Evolving Themes

The themes below have been noted in previous reports and continue to undermine vaccine confidence. The information highlighted below focuses on what is new or different from previous reports. For additional context and previous recommendations on these themes, see previous Insights Reports.



Consumers continue to have concerns about adverse events and unknown side effects of COVID-19 vaccines.

Online accounts of menstrual irregularities, preterm births, and myocarditis following COVID-19 vaccinations have contributed to consumers' concerns about vaccine safety and adverse side effects. Several news outlets and social media users 57.58.59.60.61 discussed findings from recently published scientific studies showing COVID-19 vaccination neither caused menstrual or fertility irregularities 62.63.64.65.66 nor increased risk of preterm birth. 67.68.69.70 During this reporting period, online conversations of "COVID vaccine long term side effects" increased by more than 650%. In addition, online discussions of myocarditis and other vaccine side effects increased during this reporting period. 71.72.73.74

Social media users and news stories discussed a recently released podcast by Joe Rogan. During an interview with the podcast guest, Dr. Robert Malone, Dr. Malone expressed his belief in several pieces of misinformation related to COVID-19 vaccine safety and side effects which likely increased the spread of these beliefs on social media and in new stories. 75,76,77,78,79

Perceptions, Concerns, and Threats to Vaccine Confidence

- Some consumers believe the government and CDC are suppressing or ignoring VAERS data.^{80,81,82}
- Some social media users cited personal experiences and unverified statistics as evidence of a high number of reproductive system disorders^{83,84,85} and myocarditis,^{86,87,88,89,90} following COVID-19 vaccinations.
- Some consumers expressed the belief that an individual can get "Vaccine Acquired Immune Deficiency Syndrome" or "immune erosion" from COVID-19 vaccinations. 21,92,93,94,95



Content Gaps and Information Voids

- What are the side effects of COVID-19 vaccinations?
 - Common side effects include pain, redness, swelling, tiredness, headache, muscle pain, fever. Severe allergic reactions and adverse effects that could cause a long-term health problem are extremely rare. 96,97
- What are the effects of COVID-19 vaccines on fertility?
 - There is currently no evidence that any vaccines, including COVID-19 vaccines, effect fertility in women or men.^{98,99}
 However, a recent study found that women who received COVID-19 vaccines had a less than one-day increase in the length of their menstrual cycles around the time of their doses.¹⁰⁰
- What are the effects of COVID-19 vaccines on pregnancy?
 - There is currently no evidence that COVID-19 vaccines increase risk of preterm birth, low birth weight, or stillbirth.^{101,102} SARS-CoV-2 infection during pregnancy may increase the risk of severe illnesses, hospitalizations and deaths in mothers and newborns.^{103,104} A recent MMWR found that completion of a 2-dose mRNA COVID-19 vaccination series during pregnancy might help prevent COVID-19 hospitalization among infants aged <6 months.¹⁰⁵
- What is the risk of myocarditis after mRNA COVID-19 vaccination?
 - The known risks of COVID-19 illness and its related, possibly severe complications, such as long-term health problems, hospitalization, and even death, far outweigh the potential risks of having a rare adverse reaction to vaccination, including the possible risk of myocarditis or pericarditis.¹⁰⁶
 - Most patients with myocarditis or pericarditis who received care responded well to medicine and rest and felt better quickly.
 Patients can usually return to their normal daily activities after their symptoms improve.
 - Infection with the virus that causes COVID-19 increases the likelihood of myocarditis.

^hMeltwater

Misinformation Themes

- Batches of the Moderna COVID-19 vaccine are causing deaths, but the government and news outlets are not reporting on it.
- COVID-19 vaccines are causing an unprecedented number of deaths. 110,111
- Risks of adverse side effects and deaths from COVID-19 vaccines outweigh the benefits of vaccine effectiveness against hospitalizations and deaths.¹¹²

Ways to Take Action

- Encourage healthcare providers to engage in conversations that address vaccine safety concerns by discussing potential side effects, vaccine benefits, and low rate of adverse events using an empathy-based approach.
- Tailor and disseminate messages relating to reproductive health through trusted messengers on the following vaccine-related topics:¹¹³
 - No safety concerns have been identified for people who received an mRNA COVID-19 vaccine late in pregnancy or for their infants.
 - There is no increased risk of miscarriage after receiving the COVID-19 vaccines.
 - CDC, FDA, and vaccine manufacturers continue to monitor the safety of COVID-19 vaccinations during pregnancy.
- Increase messages highlighting the potential severity of illnesses associated with infection with the virus that causes COVID-19 (e.g., myocarditis, adverse pregnancy outcomes, deaths etc.).



Consumers express concerns and opposition to COVID-19 vaccines for children.

Some parents continue to oppose COVID-19 vaccination for children of all ages. 114,115,116 Interest in vaccines for children younger than five years increased as evidenced by searches for "Covid vaccine for kids under five" almost doubling since the previous reporting period. As COVID-19 cases and hospitalizations among children increase, 117,118,119 vocal vaccine opponents continue to state that the risk of long-term side effects from the vaccine outweigh the perceived risk of mild COVID-19 symptoms. According to a recent poll, only 37% of parents considered it essential to vaccinate their children before "return to normal." 120

Perceptions, Concerns, and Threats to Vaccine Confidence

- Some social media users are concerned that the pandemic will not end if children are not vaccinated^k or because the COVID-19 vaccines are ineffective.
- Vaccine uptake among eligible children is uneven and relatively low as pediatric hospitalizations continue to rise. k,123,124,125 This concerns many medical and public health professionals.
- Some parents report refraining from vaccinating their children due to concerns of unknown and long-term side effects, perceptions that children are a low-risk population, and lack of trust in public officials. 126,127,128,129,130,131
- Some social media users are claiming that other countries not approving COVID-19 vaccines demonstrates that children should not get the vaccine in the United States.

Content Gaps and Information Voids

- When will a COVID-19 vaccine for children ages 4 and younger be available?
 - Currently, children ages 4 years and younger are not eligible for a COVID-19 vaccine in the United States; however, clinical trials are underway. The best way currently to protect children ages 4 years and younger is to vaccinate everyone ages 5 years and older who are around them and to follow other CDC guidance for preventing COVID-19 transmission, including masking. 136,137 The FDA postponed the Vaccines and Related Biological Products Advisory Committee (VRBPAC) meeting originally scheduled for February 15, 2021, to give the agency time to consider additional data, allowing for a transparent public discussion as part of their usual scientific and regulatory processes for COVID-19 vaccines. FDA will provide an update on timing for the advisory committee meeting once additional data is received on a third dose in this age group from the company's ongoing clinical trial and have an opportunity to complete an updated evaluation.
- Where can parents find COVID-19 tests for children ages 4 and younger?
 - Parents can visit their <u>state</u>, <u>tribal</u>, <u>local</u>, or <u>territorial</u> health department's website to look for the latest local information on testing.¹³⁹
 - Parents can visit their healthcare provider to get a self-collection kit or self-test. 140
- Should children receive a booster dose?
 - Everyone ages 12 years and older should get a COVID-19 booster dose. Currently, a booster dose is not recommended for children ages 11 years and younger.
- How was the vaccine developed for children and what are the associated adverse events?^m
 - Before recommending COVID-19 vaccination for children, scientists conducted clinical trials with thousands of children and found no serious safety concerns. Learn more about the <u>process of developing</u>, <u>authorizing</u>, <u>and approving COVID-19 vaccines</u>.

Misinformation themes

- Children do not need the COVID-19 vaccine because deaths, hospitalizations, and infections are low. 142,143,144,145
- The flu is worse than COVID-19 in children because the risk of severe side effects from COVID-19 is very low for children.^{m,146,147}
- COVID-19 vaccines for children are a part of an experiment by large pharmaceutical companies. 148,149,150

Ways to Take Action

- Encourage public health experts, community leaders, and pediatricians to promote pediatric vaccinations to parents.
- Develop plain language information about the steps involved in vaccine development and adverse events for media distribution.
- Provide public health professionals, doctors, schools, and daycare centers with COVID-19 mortality and morbidity information to clarify COVID-19 risk in children.

ⁱGoogle Trends

Tanaq Social Listening Report

^kCDC Community Surveillance Report

CDC-INFO

^mTanaq Social Listening Report



Consumers voiced their opposition to any vaccine requirements

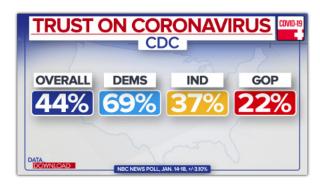
On January 13, 2022, the United States Supreme Court voted to block the Occupational Safety and Health Administration (OSHA) vaccine requirement for businesses with more than 100 employees. Citing this decision, a federal judge in Texas blocked the executive order requiring COVID-19 vaccines for federal employees. Despite the ruling, 30% of polled companies plan to require employee vaccination. The Supreme Court voted to uphold the requirement for recipients of Medicare and Medicaid funding to ensure their staff is vaccinated against COVID-19 unless exempt for medical or religious reasons. Recent consumer polling indicates a slight majority of respondents support workplace requirements.

Perceptions, Concerns, or Threats to Vaccine Confidence

- Many consumers expressed their support on social media for the Supreme Court's decision to block the OSHA requirement for businesses with more than 100 employees^{156,157} while others participated in protests against the requirements.^{158,159,160,161}
- Some polling indicated that levels of trust in employers' COVID-19specific communication exceeded levels of trust in CDC.
- Blocking OSHA's COVID-19 vaccination requirement may decrease vaccine confidence by contributing to a perception that vaccines are unnecessary, ineffective, or illegal.

Content Gaps and Information Voids

- Why was the vaccine requirement blocked?
 - The Supreme Court's decision to block the OSHA vaccine requirement rule was based on a perceived inability to enforce the vaccination requirement¹⁶³ and the need for congressional approval for broader vaccination requirements.¹⁶⁴
- Can companies still require vaccination?
 - Given the categorization of COVID-19 as a 'direct threat' by the Equal Employment Opportunity Commission, companies can require employees to be vaccinated or tested for COVID-19 regularly. <a href="https://linear.ncbi.nlm.nc





Misinformation Themes

- Vaccine requirements are illegal¹⁶⁸ and not effective. ^{169,170}
- The high transmissibility of the Omicron variant means vaccine requirements are unnecessary.
- Vaccination requirements are the first step to enact population control.

Ways to Take Action

- Support employers that have existing vaccine requirements by providing or helping them craft messages about the importance
 of vaccination for their employees or offer onsite vaccinations.
- Support employers that do not have existing vaccine requirements by helping them implement COVID-19 preparedness, response, and control plans.¹⁷⁵

Appendix: Inputs and Sources

<u>Type</u>	<u>Input</u>	<u>Cadence</u>	<u>Sources</u>	Tactics for Utilization
Social Media Listening & Media Monitoring	Communication Surveillance Report	<u>Daily on</u> <u>weekdays</u>	• <u>Google news</u> • <u>Meltwater</u> • <u>CrowdTangle</u> • <u>Native platform searches</u>	 Share of voice topic analysis to identify themes Emerging topics
	Meltwater	Daily	 Facebook, Twitter, Instagram Blogs News media Online forums 	 Share of voice topic analysis Emerging theme topics Identify high reach/velocity topics
	OADC (Office of the Associate Director of Communication) Channel COVID-19 Post metrics	Weekly	Sprout Social Native OADC account analytics	 Analyze # of posts, topics Success of messages, # of impressions, reach, # engagements
	OADC Channel Comment Analysis	<u>Daily on</u> <u>weekdays</u>	Native platform searches	Sentiment analysisIdentify message gaps/voids
Direct Reports	CDC-INFO Metrics	Weekly	CDC-INFO inquiry line list Prepared response (PR) usage report	 Cross-compare PR usage with inquiry theme analysis Sentiment analysis Identify information gaps/voids
	VTF Media Requests	Weekly	• Media request line list	Leading indicator for news coverage Identify information gaps/voids
	Web Metrics	Weekly	• <u>Top pages</u> • <u>Google search queries</u> • <u>Top FAQs</u> • <u>Referring domains</u>	Identify information gaps/voids, Identify keywords/search terms, changes in web traffic
<u>Research</u>	Poll Review	Weekly	Harris Poll, PEW research, Gallup Poll, KFF New data related to vaccine hesitancy	Identify socio-behavior indicators related to motivation and intention to vaccinate
	<u>Literature Review</u>	Weekly	 PubMed, LitCovid, ProQuest Central, Altmetric New data related to vaccine hesitancy 	Identify current vaccination intention Identify barriers to vaccination
Third Party Reports	Tanaq Social Listening +Media Monitoring Report	Weekly	Meltwater Sprout Social First Draft Native platform searches	Trending topics Demographic and geographic conversation monitoring
	CrowdTangle content insights report	Biweekly	• <u>Facebook</u>	 Top pages (voices), groups General trends/sentiment analysis News analysis through posts
	First Draft News Vaccine Misinformation Insights Report	Monthly	Proprietary methods	 Media trends analysis Emerging threats and data deficits Online vaccine narratives
	<u>Project VCTR</u>	Weekly	Proprietary methods	 National and regional trends in negative attitudes toward vaccination Conversations around Legislation
	<u>Virality Project</u>	<u>Weekly</u>	Proprietary methods	Mis- and disinformation trends related to COVID-19 vaccine